



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : B62B 3/02, B62D 51/04	A1	(11) International Publication Number: <b>WO 95/20514</b> (43) International Publication Date: 3 August 1995 (03.08.95)
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(21) International Application Number: PCT/SE94/01270

(22) International Filing Date: 30 December 1994 (30.12.94)

(30) Priority Data:  
9400238-3 26 January 1994 (26.01.94) SE

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(81) Designated States: AM, AT, AT (Utility model), AU, BB, BG, BR, BY, CA, CH, CN, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, ES, FI, FI (Utility model), GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, SK (Utility model), TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).

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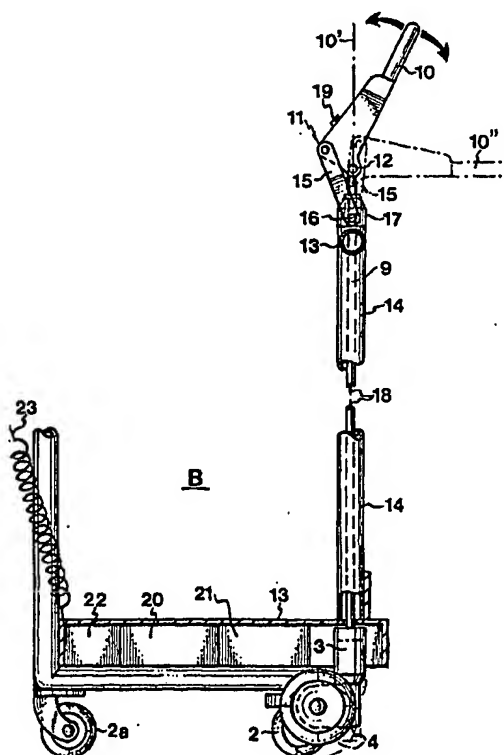
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

In English translation (filed in Swedish).

(54) Title: MOTOR-DRIVEN TROLLEY

## (57) Abstract

A trolley (B), which is adapted to be connected to a wheel-mounted loading trolley (A), has idle wheels (2, 2a) on which it can be wheeled by hand, either alone or together with the loading trolley (A). The trolley (B) further has a motor-driven wheel (4). The wheel (4) and the associated motor (3) are fixed to a tube (9) which is vertically displaceable and rotatably mounted in the chassis (13) of the trolley (B). By an operating handle (10), the tube (9) can be vertically displaced in the chassis (13). The operating handle (10) is articulated to the tube (9) and the chassis (13) by means of a dead-centre elbow mechanism (11). In the one stable position of the elbow mechanism (11), the motor-driven wheel (4) has floor contact in order to drive the trolley (B) and the loading trolley (A), if connected thereto. In the other stable position of the elbow mechanism (11), only the idle wheels (2, 2a) of the trolley (B) have floor contact when the trolley (B) is connected to the loading trolley (A).



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### MOTOR-DRIVEN TROLLEY

This invention relates to a motor-driven trolley which is intended to be connected to a wheel-mounted loading trolley in order to drive the latter.

EP-B1-0 281 536 discloses a laundry trolley for use at hotels, hospitals and the like. This trolley is designed for use as a cleaning trolley, one or more removable sections for the cleaning articles being then applied to the trolley. The section or sections are preferably equipped with wheels, as is the trolley itself (in the following referred to as the loading trolley).

The use of such section-equipped loading trolleys has created a need for facilitating their displacement. To this end, such a section is provided with a motor which is so arranged, according to one aspect of the invention, that the section (in the following referred to as the motor-driven trolley) is easily and expediently connectible to the loading trolley and that the assembly consisting of the loading trolley and the motor-driven trolley is easily driven with the aid of the motor-driven trolley. Another, secondary, aspect of the invention is that the motor-driven trolley should itself be movable by motor operation and that it should be possible to wheel by hand not only the motor-driven trolley but also the assembly consisting of the loading trolley and the motor-driven trolley.

The objects of the invention are achieved by means of the trolley according to the claims.

The invention will now be described in more detail with reference to the accompanying drawings, in which

Figs 1A and B and 2A and B illustrate the inventive concept, and

Fig. 3 shows an arrangement for moving the driving wheel of the motor-driven trolley between two stable positions.

Figs 1A and B and 2A and B, which illustrate the inventive concept, show an undriven loading trolley A having four castor wheels 1, as well as an inventive motor-driven trolley B having two fixed wheels 2 and two castor wheels 2a. The motor-driven trolley B has a battery-powered motor 3 and a wheel 4 fixed to the output shaft thereof. The

motor-driven trolley B can be mechanically connected to the loading trolley A in order to drive the latter. The wheel 4 with the associated motor 3 is vertically displaceable in the motor-driven trolley B, such that it can be brought into engagement with the floor C, which enables the motor-driven trolley B and the loading trolley A connected thereto to be driven on the floor C (Fig. 1B), in which case the wheels 2, 2a of the motor-driven trolley have no floor contact. When the wheel 4 is drawn up, the motor-driven trolley B and the loading trolley A optionally connected thereto can be wheeled by hand on the floor C on the wheels 1, 2a, 2 (Figs 1A and 2B), or preferably on the wheels 1 only when interconnected, which makes it easier to cross thresholds because the trolley B is hanging freely on the loading trolley A, in which case e.g. the wheels 2, 2a may have a suspension of shorter length than the one shown in the Figures. As appears from the drawings, the wheel 4 is arranged behind the wheels 2, 2a at the back of the motor trolley B. When the wheel 4 is in the lower position (the driving position), also the castor wheels 2a can thus have floor contact, so that the motor-driven trolley B can be driven separately (Fig. 2A).

In view of the mechanical interconnection of the trolleys A and B, the motor-driven trolley B is provided with hooks 5, 6, and the trolley A is provided with pockets or rods 7, 8. The hook 5 is articulated and preferably spring-loaded, such that the hook 6 is first brought into engagement with a pocket or rod 7 (after tilting the motor-driven trolley B clockwise, as seen in Figs 1 and 2), and the hook 5 is then brought into engagement with a pocket or rod 8. EP-B1-0 281 536 describes such an interconnection arrangement, as well as other such arrangements that might be used.

The vertical displacement of the wheel 4 and the associated motor 3 is brought about with the aid of a tube 9 fixedly connected to the wheel 4 and the motor 3, an operating handle 10 and a dead-centre elbow mechanism 11 (see Fig. 3) interconnecting the tube 9 and the handle 10. The operating handle 10 is articulated to the tube 9 at 12 and to a tube 14 by means of a link 15. In the tube 14, which is fixedly connected to the chassis 13 (which carries the wheels 2, 2a) of the motor-driven trolley, the tube 9 can be vertically displaced as well as rotated about its longitudinal axis. For enabling the trolley A

to be driven on an even floor C from the stable end position shown in Fig. 1A (all the wheels 1, 2, 2a, or merely the wheels 1, having floor contact), the elbow mechanism 11 passes from a position in which the handle 10 is vertical (dash-dot line 10'; the centre axis) to a position  
5 in which the handle 10 has been turned through 90° (dash-dot line 10'') in which the wheels 2, 2a have been moved out of previous floor contact, if any, a dead-centre position having been passed, as indicated by the dash-dot link 15.

The stroke length of the tube 9 can be suitably set by having the  
10 point of articulation 16 of the link 15 on the tube 14 arranged on a stop bushing 17, which is vertically displaceable on the tube 14 and can be fixed in the set vertical position and which further can rotate round the tube 14 to enable rotation of the wheel 4, such that the trolley A can be moved in different directions.

15 An electric wire 18 running through the tube 9 connects electric control means 19 provided on the handle 10 with the motor 3 via control electronics 20 for the motor 3. The control electronics 20 may, inter alia, be adapted to adjust the speed and reverse the motor 3. There are further provided a chargeable battery 21 and a battery  
20 charger 22, which is charged from a wall socket by means of an electric wire 23.

## CLAIMS

1. A trolley (B) which is adapted to be connected to a wheel-  
5 mounted loading trolley (A) and which has idle wheels (2, 2a) and  
connecting means (5, 6) for said connection, c h a r a c t e r -  
i s e d in that
- the trolley (B) further has a motor-driven wheel (4),
  - the motor-driven wheel (4) and its motor (3) are fixed to a tube  
10 (9),
  - the tube (9) is vertically displaceable and rotatably mounted  
in the chassis (13) of the trolley (B),
  - the tube (9) has an operating handle (10) for vertical displace-  
ment of the tube (9) in the chassis (13), and
  - 15 - the operating handle (10) is articulated to the tube (9) and the  
chassis (13) by means of a dead-centre elbow mechanism (11);
  - the motor-driven wheel (4) having, in the one stable position  
of the elbow mechanism (11) but not in the other, floor contact in  
order to drive the trolley (B) and the loading trolley (A) connected  
20 thereto.
2. A trolley as set forth in claim 1, c h a r a c t e r i s e d  
in that the connecting means (5, 6) or the idle wheels (2, 2a) and the  
elbow mechanism (11) are so arranged that, when the trolley (B) is  
connected to the loading trolley (A), the other stable position of the  
25 elbow mechanism (11) does not permit floor contact for any of the  
wheels (2, 2a, 4) of the trolley (B).
3. A trolley as set forth in claim 1 or 2, c h a r a c t e r -  
i s e d in that the tube (9) can rotate in the chassis (13) of the trolley  
(B).
- 30 4. A trolley as set forth in any one of claims 1-3, c h a r a c -  
t e r i s e d in that the motor-driven wheel (4) is so positioned that  
the trolley (B) itself can be motor-driven on the motor-driven wheel (4)  
and on at least two (2a) of the idle wheels.

FIG. 1A

1/2

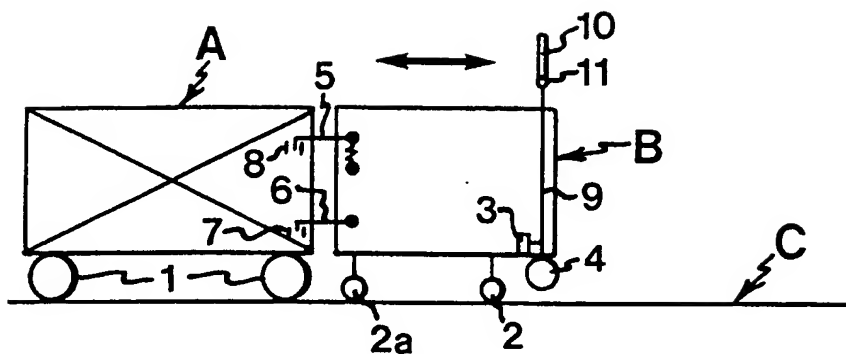


FIG. 1B

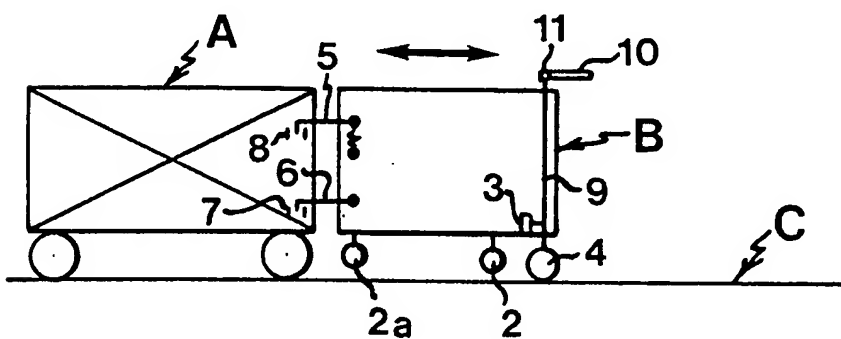


FIG. 2A

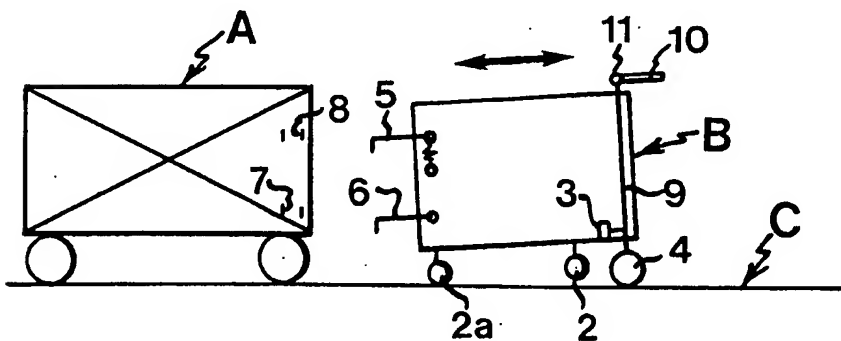
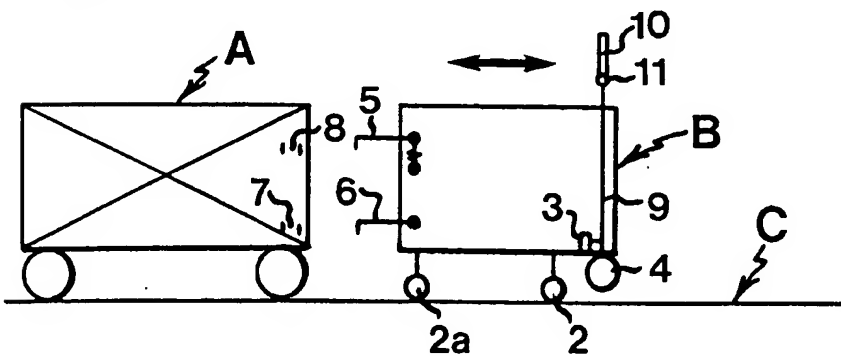
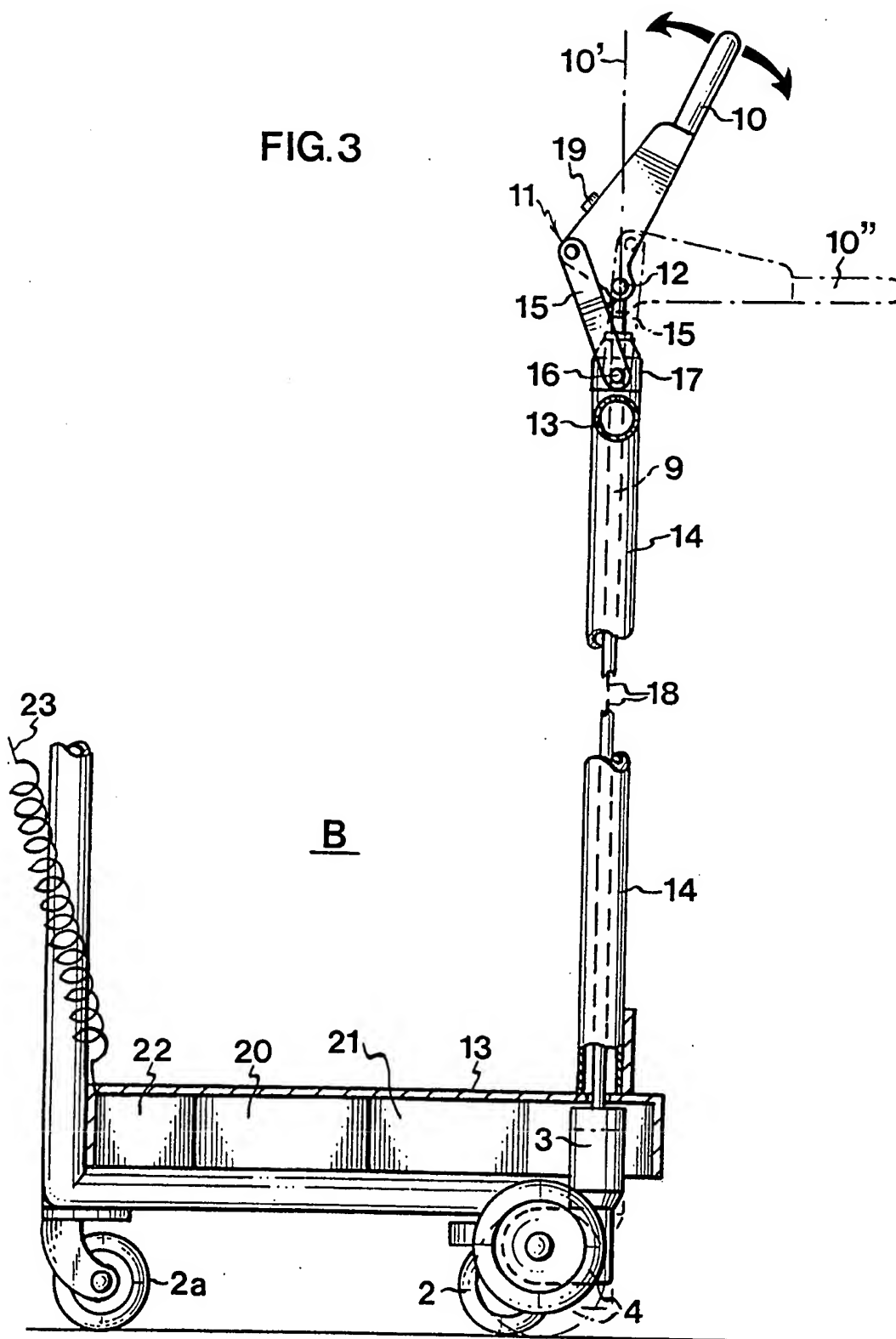


FIG. 2B



2/2

FIG. 3





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/01270

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B62B 3/02, B62D 51/04

According to International Patent Classification (IPC) or to both national classification and IPC

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR, B1, 2120301 (LEBRE, CHARLES), 18 August 1972 (18.08.72) --	1
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A	GB, A, 2049577 (THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA), 31 December 1980 (31.12.80) --	1
A	US, A, 1116295 (P. KLECKNER), 3 November 1914 (03.11.14) -- -----	1

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US-A- 1116295	03/11/14	NONE	